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Publication date:
2015

Document Version
Publisher's PDF, also known as Version of record

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Citation (APA):
Hedegaard, C. J., Strube, M. L., Bendix Hansen, M., Kjær Lindved, B., Larsen, L. E., Lihme, A., Boye, M., & Heegaard, P. M. H. (2015). *Swine plasma immunoglobulins for prevention and treatment of post-weaning diarrhoea: Safety and Preliminary results*. Abstract from 5th European Veterinary Immunology Workshop, Vienna, Austria.

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Swine plasma immunoglobulins for prevention and treatment of post-weaning diarrhoea: Safety and Preliminary results

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Post-weaning diarrhoea (PWD) is a common condition in intensive swine production, resulting in reduced welfare of weaners and economic losses for the farmer as a result of illness, death, and treatment costs. It is also one of the main causes of antibiotics- and zinc use in the pig production industry. We aim at developing a sustainable product for protection against PWD based on natural antibodies (immunoglobulins) derived directly from inexpensive raw materials. The availability of such an inexpensive and highly active immunoglobulin product would allow swine producers to reduce expenses and minimize the on antibiotics and zinc usage. Swine immunoglobulins were isolated directly from slaughterhouse swine plasma-waste by expanded bed chromatography. It was shown that the isolated Immunoglobulin fraction bound enterotoxigenic *Escherichia coli* (ETEC) and *Salmonella* ssp. and inhibited their adhesion to porcine epithelial cells *in vitro*. As the immunoglobulin fraction is intended for oral use as a feed supplement, we also tested the safety of feeding 4 grams of natural immunoglobulins to 4-5 week old weaner piglets for 14 days and observed no adverse effects. In an experimental model of *E. coli* F4+ induced PWD, we observed that piglets given IgG as a feed supplement cleared the *E. coli* infection significantly faster than control weaner piglets not receiving an immunoglobulin feed supplement. Furthermore, deep sequencing of the ileal microbiota showed a significantly lowered colonization of the family *Enterobacteriaceae* in immunoglobulin fed piglets as compared to the control group. Thus pig slaughterhouse plasma is indicated as a potential source resource of antibodies for the control of PWD.